DRISI

Caltrans Division of Research, Innovation and System Information

Research Results

Measuring the Air Quality Gains of HOV Lanes

Managing lane usage is an effective method for reducing emissions

Planning/ Policy/ System Information

FEBRUARY 2015

Project Title:
Deployment of Prior HOV Lanes Research Results in Developing Analysis Tools for New Managed Lanes Projects

Task Number: 2329

Start Date: April 1, 2012

Completion Date: March 31, 2014

Product Category: New or improved decision support tool, simulation, model, or algorithm (software)

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WHAT WAS THE NEED?

Managed lanes—high-occupancy vehicle (HOV) lanes, express lanes, and high-occupancy toll (HOT) lanes—are an integral part of California's highway system, with over 1,500 lane miles either in operation or under construction and hundreds of more lane miles proposed. The goals of HOV lanes are to relieve congestion, conserve fuel, and improve the air quality in metropolitan areas. It is necessary to ensure that existing, converted, and new managed lane projects are meeting the purpose of improving air quality. Based on the results from previous tasks, this project developed a modeling toolset to provide reliable estimates of the air quality impacts of HOV lanes.

WHAT WAS THE GOAL?

The goal was to enhance analysis tools developed in previous tasks to evaluate the emission impacts of different types of managed lanes.

Caltrans provides a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

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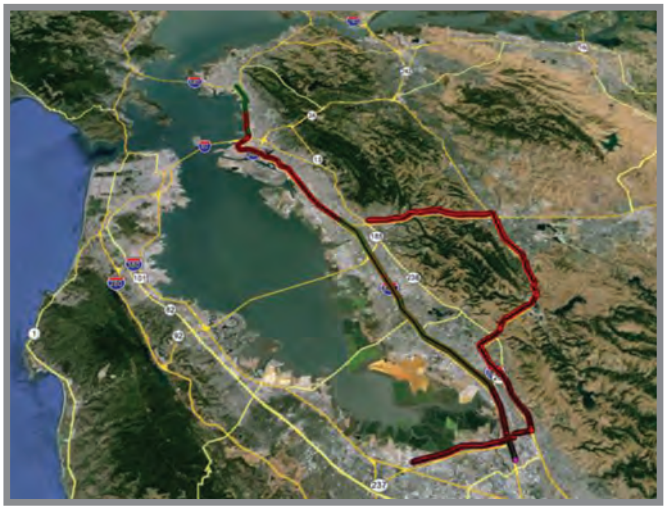
WHAT DID WE DO?

Caltrans, in partnership with the University of California, Riverside Center for Environmental Research and Technology, had previously completed research on the effectiveness of HOV lanes in improving air quality. As part of that study, the researchers had developed analysis tools to evaluate the emission impact of limited-access HOV lanes, which are commonly found in Southern California. This project expanded the capability of the developed tools to incorporate vehicle activity data collection, traffic simulation, and emission modeling to enable evaluation of other types of managed lanes, including continuous-access HOV lanes, generally used in Northern California, and HOT lanes. The researchers defined the mandatory and optional data inputs as well as the corresponding outputs. They then implemented the analysis steps and data flow in Microsoft Excel.

WHAT WAS THE OUTCOME?

The analysis tools are compatible with California's EMission FACtors (EMFAC) model, using a spreadsheet platform that is easy to use by Caltrans technical staff. The deployment was supported with a user guide and training conducted to ensure effective knowledge and technology transfer.



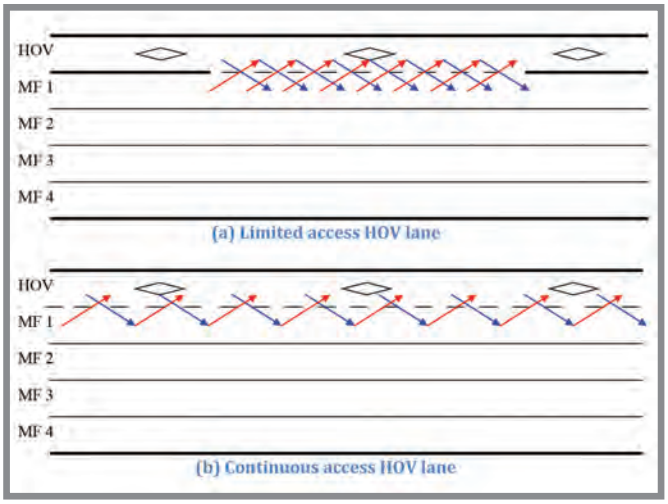
Data collection sites in Northern California

WHAT IS THE BENEFIT?

HOV lanes produce less pollutant emissions per lane as compared to adjacent general-purpose lanes. The enhanced tools help quantify the air quality benefits of the various types of HOV lanes, allowing Caltrans to set appropriate operation policies based on sound scientific findings. Caltrans can also use these measurements to quickly prepare environmental review documents to ensure timely delivery of managed lane projects.

LEARN MORE

To view the complete report:
www.dot.ca.gov/research/researchreports/reports/2014/final_report_task_2329.pdf



Configurations of HOV lanes in California